

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Previously Presented) A high power diode laser system having narrow spectral width output comprising:
 - (a) a high power diode laser that produces multimode laser light output at power levels of at least one watt and having a relatively broad spectral range;
 - (b) a collimating element positioned to receive the output of the laser diode and provide a collimated output beam; and
 - (c) a diffraction grating mounted to receive the collimated beam from the collimating element on a beam path, the diffraction grating oriented at an angle to the collimated beam such that a portion of the light in the collimated beam incident on the grating is directed back on the beam path to the collimating element and is focussed on the diode laser to provide feedback thereto to narrow the spectral range of the laser light output; and
 - (d) a polarization rotation element in the beam path from the collimating element to the diffraction grating, the polarization rotation element oriented such that the light on the beam path passed therethrough to the diffraction grating is oriented with respect to the diffraction grating to provide a selected efficiency of the diffraction grating and to select the amount of light directed back by the diffraction grating toward the diode laser to provide effective feedback without damaging the diode laser, wherein the polarization rotation element is mounted for rotation to allow rotation of the polarization rotation element to select the amount of feedback to the diode laser.
2. (Cancelled).
3. (Cancelled).
4. (Previously Presented) The laser system of Claim 1 wherein the polarization rotation element is a half wave plate.
5. (Cancelled).

6. (Original) The laser system of Claim 1 further including a compensating lens mounted to compensate for astigmatism in the output light from the diode laser.

7. (Original) The laser system of Claim 1 wherein the collimating element comprises a spherical lens.

8. (Original) The laser system of Claim 1 wherein the diode laser provides two spatially diverging output beams on two beam paths, wherein there are two diffraction gratings, each mounted to intercept the beam on one of the beam paths, the gratings partially reflecting the beam on each beam path back on the beam path through the collimating lens to focus the light back onto the position in the diode laser from which the light on that beam path originated.

9. (Original) The laser system of Claim 8 including a polarization rotation element mounted in each of the two beam paths to control the amount of feedback from the gratings to the diode laser.

10. (Cancelled).

11. (Cancelled).

12. (Cancelled).

13. (Previously Presented) A method of narrowing the spectral width of the output of a high power diode laser that produces multimode laser light output at power levels of at least one watt having a relatively broad spectral range, comprising:

(a) receiving the output of the diode laser with a collimating element to provide a collimated output beam; and

(b) directing the collimated output beam to a diffraction grating mounted to receive the collimating beam from the collimated element on a beam path, and directing a portion of the beam from the grating back on the beam path to the collimating element and focusing the beam on the diode laser to provide feedback thereto to narrow the spectral range of the laser light output, selecting the amount of light directed back by the diffraction grating to the diode laser to

provide effective feedback without damaging the diode laser by passing the light on the beam path through a polarization rotation element, and rotating the polarization rotation element about an axis parallel with the output beam from the collimating element to select the amount of feedback to the diode laser.

14. (Cancelled).

15. (Cancelled).

16. (Previously Presented) The method of Claim 13 wherein the polarization rotation element through which the light is passed is a half wave plate.

17. (Previously Presented) A method of narrowing the spectral width of the output of a high power diode laser that produces multimode laser light output at power levels of at least one watt having a relatively broad spectral range that includes a wavelength at which a selected gas can be laser polarized, comprising:

(a) receiving the output of the diode laser with a collimating element to provide a collimated output beam;

(b) directing the collimated output beam to a diffraction grating mounted to receive the collimated beam from the collimating element on a beam path, and directing a portion of the beam from the grating back on the beam path to the collimating element and focusing the beam on the diode laser to provide feedback thereto to narrow the spectral range of the laser light output, such that the spectral range is centered at the wavelength at which the selected gas can be polarized, and

(c) passing the output light beam from the diffraction grating into a cell containing a sample of the selected gas to laser polarize the gas.

18. (Original) The method of Claim 17 wherein the gas is selected from the group consisting of xenon, helium, mixtures of xenon and rubidium, mixtures of helium and rubidium, mixtures of cesium and xenon, and mixtures of potassium and helium.

19. (Original) The method of Claim 13 including directing a portion of the beam from the diffraction grating to provide a useable output light beam.

20. (Cancelled).

21. (Cancelled).

22. (Cancelled).

23. (Cancelled).

24. (Cancelled).

25. (Cancelled).

26. (Cancelled).

27. (Cancelled).

28. (Cancelled).

29. (Cancelled).

30. (Cancelled).

31. (Cancelled).

32. (Cancelled).

33. (Cancelled).

34. (Cancelled).

35. (Cancelled).

36. (Cancelled).

37. (Cancelled).

38. (Cancelled).